

REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This Response is in reply to the final Office Action mailed November 19, 2004 (hereinafter, the "Office Action"). A Request for Continued Examination is submitted herewith.

In the Office Action, claims 1, 3, 4, 8-28 and 31-39 were pending. Claims 1, 3, 4, 8-10, 36 and 37 were allowed. Claims 11-28, 31-35, 38 and 39 were rejected. Claims 1, 3, 4, 8-28, 33 and 36-39 remain in the application. Claims 1-28 were originally presented; claims 29-39 were subsequently added. Claims 40 and 41 have been added herein. Support for new claims 40 and 41 can be found in at least FIGs. 14c and 15. Claims 31-32 and 34-35 have been canceled without prejudice. Claims 3, 11, 15, 21 and 33 have been amended without narrowing the scope thereof.

Applicant expresses appreciation to the Examiner for the indication of allowable subject matter in claims 1, 3, 4, 8-10, 36 and 37.

Double Patenting

It was advised in the Office Action that, should claim 32 be found allowable, claim 35 will be objected to under 37 C.F.R. 1.75 as being a substantial duplicate thereof. Claims 32 and 35 have been canceled without prejudice.

Claim Rejections - 35 U.S.C. § 102

Claim 31 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,913,681 ("Cho").

Claim 31 has been canceled without prejudice.

Claim Rejections - 35 U.S.C. § 102

Claims 11-16, 18-25, 27, 28, 38 and 39 (including independent claims 11 and 21) were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,466,152 ("Walter") in view of U.S. Patent No. 5,403,185 ("Presswood").

Claims 11-17, 19-26, 28, 38 and 39 (including independent claims 11 and 21) were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,788,489 (“Huffman”) in view of Presswood.

It was held in the Office Action that Walter and Huffman disclose the invention essentially as claimed except for pressing the registration pin through a thin piercable membrane extending across the registration holes, and that Presswood “discloses that it is known in the art to provide an articulator tray with a thin membrane extending across the apertures therein and piercing it by a registration pin in order to prevent dental plaster from leaking through the registration holes in the tray.”

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to independent claims 11 and 21, with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

Amended independent claim 11 includes the limitations of: . . .

a) pressing a registration pin through a thin membrane extending across a plurality of registration pin holes on a working tray of a dental articulator so that the registration pin breaks the thin membrane and extends through the thin membrane;

b) forming a prepped model of a prepped tooth by disposing dental casting material over the registration pin on the working tray of the dental articulator while the registration pin remains in the registration pin hole, the prepped model of the prepped tooth to receive a dental prosthesis;

c) maintaining a position of the registration pin in the registration pin hole through the thin membrane while the prepped model of the prepped tooth is formed; and

d) forming an opposing model of an opposing tooth on an opposing tray of the dental articulator, the opposing model of the opposing tooth opposing the prepped tooth.

(Emphasis added).

Amended independent claim 21 includes the limitations of: . . .

a) obtaining an impression of at least some of a patient’s teeth, the impression including a prepped side with an impression of a prepped tooth to receive a dental prosthesis, and an opposing side with an impression of an opposing tooth opposing the prepped tooth;

- b) obtaining a dental articulator with opposing and working trays pivotally coupled together and a thin membrane extending across a plurality of registration pin holes in the working tray;
 - c) disposing dental casting material on the opposing tray and in the opposing side of the impression;
 - d) disposing the opposing side of the impression over the opposing tray so that dental casting material extends therebetween and forms an opposing model of the opposing tooth;
 - e) positioning at least one registration pin in the plurality of registration pin holes in the working tray at a location corresponding to the prepped tooth;
 - f) pressing the at least one registration pin through the thin membrane extending across the at least one of the plurality of registration pin holes;
 - g) disposing dental casting material in the prepped side of the impression and on the working tray with the at least one registration pin remaining in the at least one of the plurality of registration pin holes to resist dental casting material from entering the plurality of registration pin holes;
 - h) maintaining a position of the at least one registration pin in the registration pin hole through the thin membrane while the dental casting material is disposed on a surface of the working tray and over a head of the at least one registration pin;
 - i) disposing the working tray over the prepped side of the impression so that the dental casting material extends therebetween and forms a prepped model of the prepped tooth; and
 - j) removing the impression from the dental articulator.
- (Emphasis added)

Thus, the presently claimed invention requires that the registration pin be maintained in the pin hole while dental casting material is applied to the trays (or on a surface of the working tray and over a head of the registration pin). In this manner, the present invention prevents dental casting material from entering the pin hole or interfering with the pin in the pin hole during the process of forming the dental model.

In contrast, the Presswood reference discloses a method of forming a prosthesis die that requires a membrane liner to be punctured with registration pins, after which the registration pins are removed from the membrane prior to applying dental plaster to the membrane while the holes are exposed by removal of the pins. This aspect of Presswood is illustrated in the annotated figures of Presswood attached hereto as Exhibit A.

As shown on page 2/3 of Exhibit A, the Presswood invention involves the use of pins 26 which are inserted through liner 16 in upper tray 12a (Presswood FIG. 7). After die stone 28 is

poured onto the impression 22, the upper tray is closed so that die stone 28 can harden and fix the pins within the die stone in the impression (as shown in FIG. 8). Once the die has hardened, the upper tray is opened, which results in the pins being withdrawn from the liner 16 as the upper tray is rotated upwardly (as shown in FIG. 9). Thus, as shown in annotated FIG. 9 in Exhibit A, the liner is punctured by each of the pins 26 after the upper tray has been opened. The punctures in the liner 16 are thus present prior to the step shown in FIG. 10 in which dental plaster 30b is added to upper tray 12a.

Thus, as shown by dashed lines in FIG. 10 (and the accompanying enlarged view adjacent FIG. 10), the apertures formed by the pins allow the uncured dental plaster to seep or leak through the liner when the trays are separated. This situation is exacerbated when the upper tray is closed over the lower tray and the pins are “reinserted” into the apertures formed in the step shown in FIG. 9. After the trays are closed, the dental plaster is allowed to cure (as shown in FIG. 11). Accordingly, the Presswood invention results in the registration pins becoming bonded by the plaster within the apertures formed through the liner. This situation is a major concern as the registration pins become very difficult to remove from the die stone after the device has been allowed to cure.

In contrast, independent claim 11 includes the limitation of pouring dental casting material over the registration pins while maintaining the pins within the registration pin holes formed in the liner. Independent claim 21 includes the limitation of pouring dental casting material on a surface of the working tray and over a head of the at least one registration pin while maintaining a position of the at least one registration pin in the registration pin hole through the thin membrane.

Neither of these steps is taught or suggested by Presswood, and each clearly provides an advantage over the Presswood system and the other systems disclosed in the references cited. In fact, Presswood actually teaches away from the presently claimed invention in that Presswood teaches the formation of holes in the liner prior to applying dental casting material over the liner.

In addition to the differences outlined above between the Presswood reference and the claimed invention, Applicant respectfully submits that the Presswood reference was improperly asserted in the Office Action for the proposition that it would have been “obvious to one skilled in the art to provide the device of [Walter or Huffman] with a thin membrane extending across the registration pin holes and then press the registration pin through the membrane in order to prevent leakage of dental plaster through the registration holes.” As the Court of Appeals for the Federal Circuit held in *In re John R. Fritch*, “one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.” (972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992)). In the present case, the Office Action has apparently relied on Presswood col. 4, lines 1-22 for the notion that Presswood teaches piercing a thin membrane with registration pins to prevent leakage of dental plaster through the registration holes.

In contrast, however, it is clear from the figures of Presswood, and the accompanying annotations to these figures in Exhibit A, that Presswood teaches i) piercing a membrane or liner with registration pins; ii) removing the registration pins from holes created by piercing the membrane; and then iii) applying dental plaster to the membrane over and in the holes. Thus, the Office Action improperly “picked and chose” one isolated disclosure from the prior art, e.g., Presswood, to deprecate the claimed invention while ignoring the clear teaching of the prior art to form open holes in the liner of Presswood prior to applying dental plaster.

Also, in *Phillips Petroleum Co. v. United States Steel Corp.*, the United States District Court for the District of Delaware held that “the prior art references relied upon must be considered in their entirety” and “disclosures in the references that diverge from and teach away from the invention cannot be disregarded” (673 F. Supp. 1278, 1315 (1987), *affirmed* 865 F.2d 1247 (Fed. Cir. 1989)). In the present case, the Office Action has failed to consider Presswood in its entirety by failing to recognize that Presswood teaches forming holes in the liner or membrane, withdrawing the pins from the holes, and then applying dental plaster to the liner or membrane. Instead, the Office Action has incorrectly disregarded the disclosures in Presswood that teach away from the present invention, e.g., that teach away from maintaining a position of the registration pins in the membrane or liner while applying dental plaster.

Further, the Court of Appeals for the Federal Circuit held, in *Bausch & Lomb v. Barnes-Hind*, that “it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art” (796 F.2d 443, 448 (Fed. Cir. 1986)). In the present case, the Office Action has “picked and chose” from the Presswood reference only so much of Presswood that will support the Office Action’s position. By doing so, the Office Action has failed to consider, or has excluded, those portions of the Presswood reference necessary to the full appreciation of what Presswood fairly suggests to one skilled in the art. That is, the Office Action has excluded the portions of Presswood that clearly teach removing the registration pins from the liner after formation of holes in the liner by the pins prior to applying dental plaster adjacent to the liner. Thus, the Office Action has failed to consider those portions of Presswood that clearly teach away from the presently claimed invention, which requires that the registration pins remain in the liner while dental plaster is applied adjacent to or on the liner.

Therefore, Applicant respectfully submits that independent claims 11 and 21, and dependent claims 12-20 and 22-28, are allowable, and urges the Examiner to withdraw the rejection. Also, as independent claims 33, 40 and 41, and their applicable dependent claims, are not anticipated or rendered obvious by the references cited, claims 33 and 38-41 are in condition for allowance.

With respect to new claim 41, Applicant notes that Presswood discloses a tray with only a grid forming square apertures.

CONCLUSION

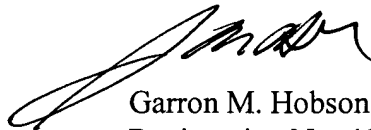
In light of the above, Applicant respectfully submits that pending claims 1, 3, 4, 8-28, 33 and 36-41 are in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Response, the Examiner is strongly encouraged to call Garron M. Hobson at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

Two independent claims, claims 40 and 41, were added while two independent claims, claims 31 and 34, were canceled. No extension of time is required in which to timely submit this Response. Therefore, no additional fee is due. Check no. 21497 is attached in the amount of \$395.00 for the RCE fee required by 37 C.F.R. § 1.17(e).

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Response to Deposit Account No. 20-0100.

DATED this 22nd day of February, 2005.

Respectfully submitted,



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EXHIBIT A

(Annotation of excerpts from Presswood, U.S. Patent No. 5,403,185)

Overall procedure of forming a prosthesis die

The invention of Presswood (5,403,185)

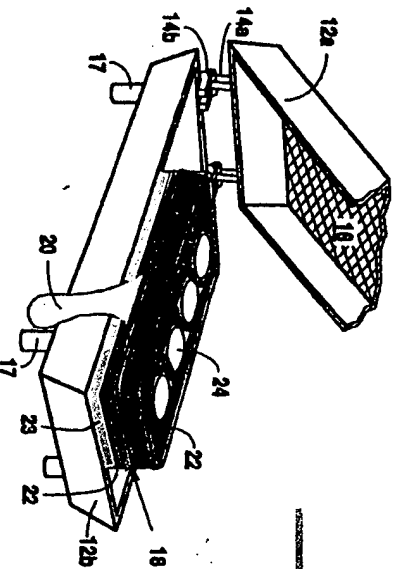


Fig. 2

(Col. 3, lines 61-66) The impression 18 is secured in the lower tray 12b by placing a quantity of dental plaster into the negative impression of the opposing teeth and also pouring a quantity of dental plaster 23 into the lower tray. The impression is then placed in the tray to allow the two quantities of dental plaster to mix and harden into an integrated dental plaster model base.

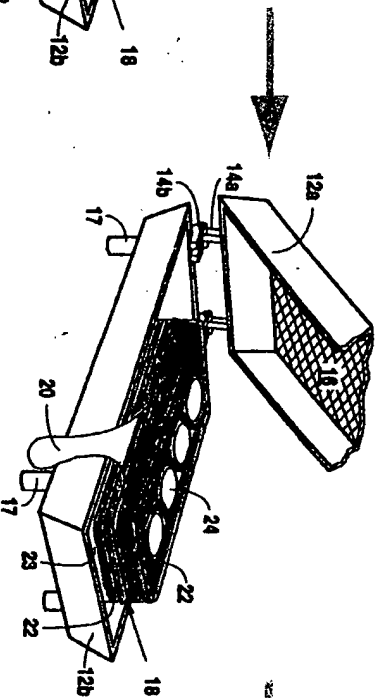


Fig. 2

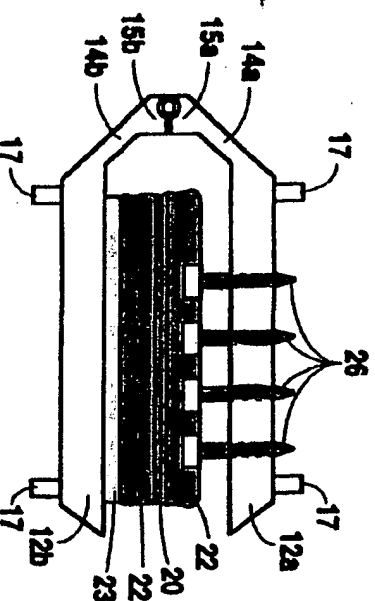


Fig. 4

(Col. 4, line 22-29) Plurality of pins 26 are positioned at the locations corresponding to the tooth impressions 24 with the upper and lower trays in the closed position shown in FIG. 3. The upper tray 12a is then rotated upwards as shown in FIG. 4, without disturbing the location of the pins in the apertures 16 of the upper tray 12a. The pins are held somewhat loosely when initially placed in the apertures 16 to determine the optimum locations corresponding to the teeth of interest. Therefore, it is necessary that the pins not be disturbed until they are securely supported in the apertures.

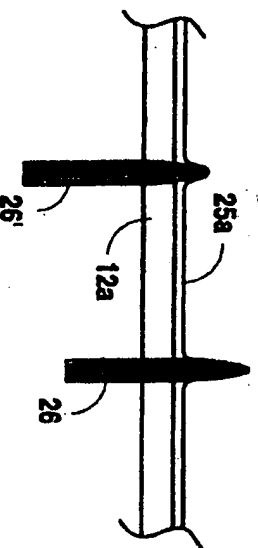


Fig. 6

(Col. 4, lines 38-56) Fig. 6 is an illustration of a method of temporarily placing the pins 26 in the apertures in one of the articulator trays. Referring to FIG. 6, a pin 26 is shown in the initial placement position wherein the tapered portion of the pin is placed in the aperture to loosely support the pin in the upper tray 12a. In the embodiment shown in FIG. 6, a membrane liner 25a to prevent leakage of dental plaster is shown on the outside tray. In the preferred embodiment of the invention, the trays 12a and 12b are formed from a plastic material and, therefore, the portion of the trays surrounding the apertures is somewhat flexible. With the pin partially inserted into the aperture, the membrane is stretched slightly but not punctured. Once the position of the pin has been verified, the pin is moved to the position shown by pin 26 in FIG. 6 with the membrane 25a being punctured and the pin held in the aperture by friction resulting from compression of the plastic material as the pin is forced to the aperture.

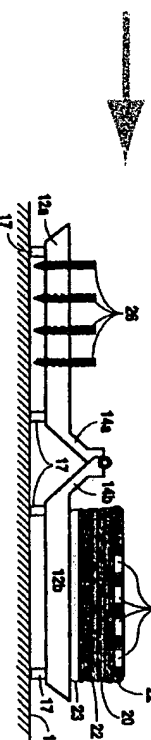


Fig. 5

(Col. 4, line 34-37) As can be seen in FIG. 5, the spacing feet 17 keep the pins from coming into contact with the working surface 19, thereby preventing the pins from being dislodged from the apertures in the tray 12a.

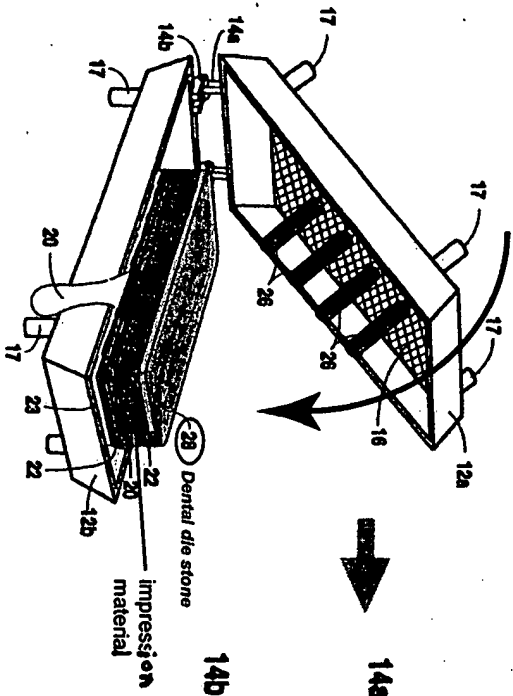


Fig. 7

(Col. 4, lines 57-59) With the upper tray 12a in the position shown in FIG. 7, a quantity of die stone 28 is placed in the impression to create a positive model of the teeth.

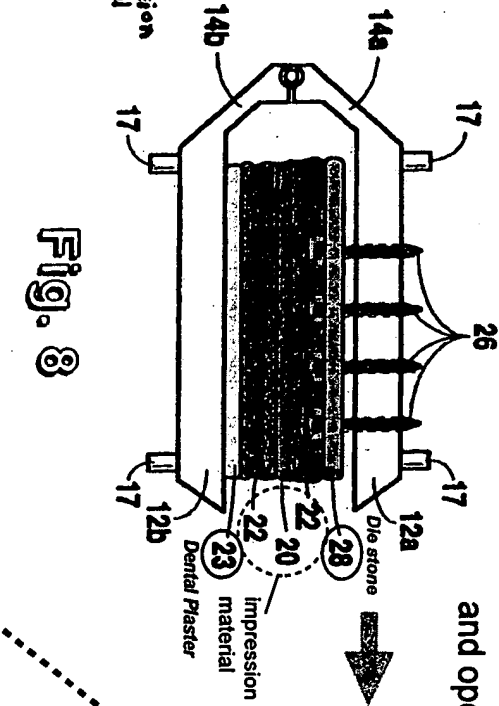


Fig. 8

(Col. 4, lines 60-65) The upper tray 12a is then rotated to the position shown in FIG. 8 with the pins 26 being inserted into the individual teeth impressions at the precise locations determined in FIG. 4. The articulator trays are left in the position shown in FIG. 8 for a predetermined length of time during which the die stone 28 hardens.

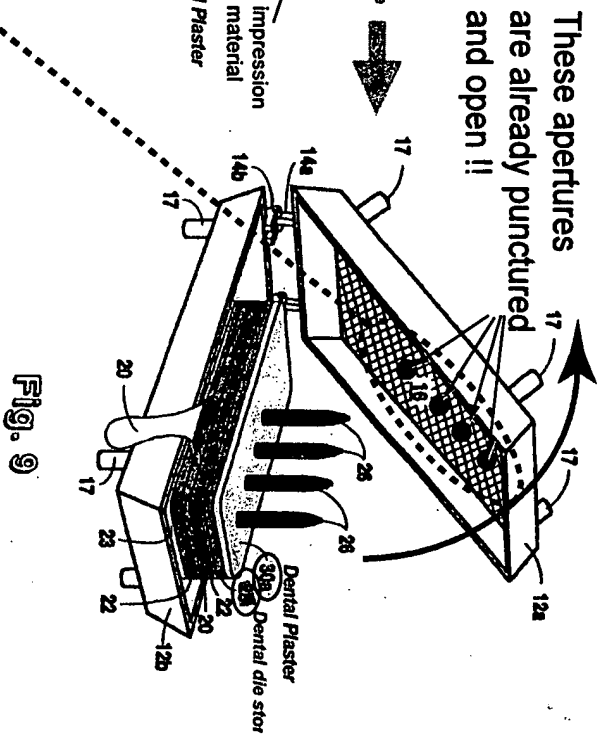


Fig. 9

(Col. 4, lines 65- Col 5, line 2) The upper tray 12a is then rotated upward with the individual pins remaining in the die stone 28, as shown in FIG. 9, and a separator is applied to the surface of the die stone. A quantity of dental plaster 30a is shown applied to the upper surface of the die stone 28.

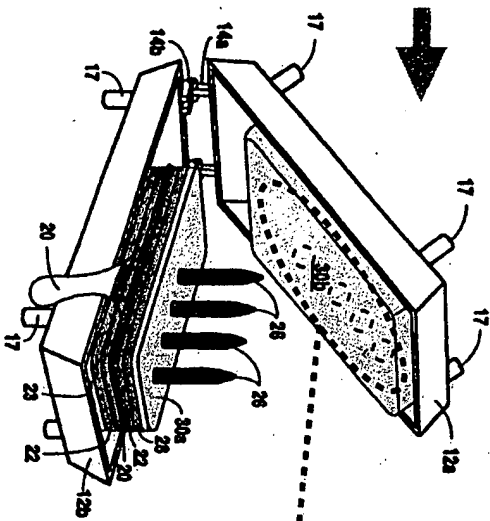


Fig. 10

(Col. 5, lines 3-4) An additional quantity of dental plaster 30b is placed in the upper tray 12a.

Plaster is already leaking !! through these apertures

Difference from the current invention (Technical Distinctions)

1. Apertures receive dental plaster, not die stone. Dental plaster (yellow color) is poured after die stone (blue color) is dried. So, this system, inconveniently, is a double pour system.
2. Apertures that are supposed to receive pins, that could be called "pin holes" if insisted, have already been punctured and are open. As a result, these 4 apertures (or these pin holes) can never prevent the passage of the dental plaster.
3. Punctured pin holes, unlike the unpunctured pin holes, can not prevent the passage of dental plaster.

EXHIBIT A 3/2

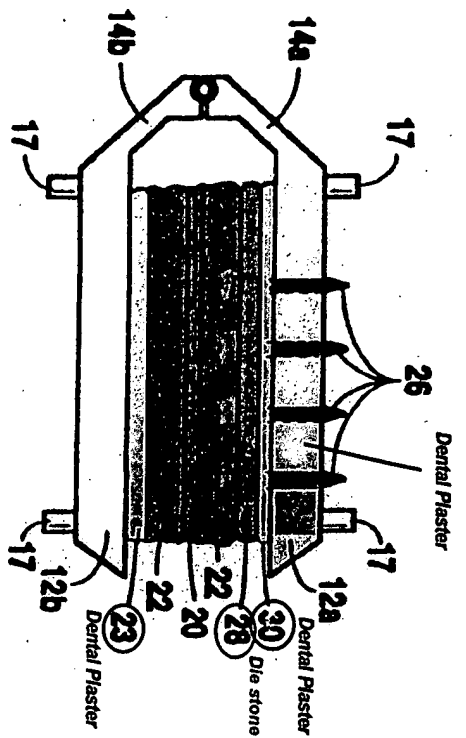


Fig. 11

(Col. 5, lines 4-7) The upper and lower trays are then aligned as shown in FIG. 11 with the quantities of dental plaster 30a and 30b forming a single layer of dental plaster illustrated generally by reference numeral 30.

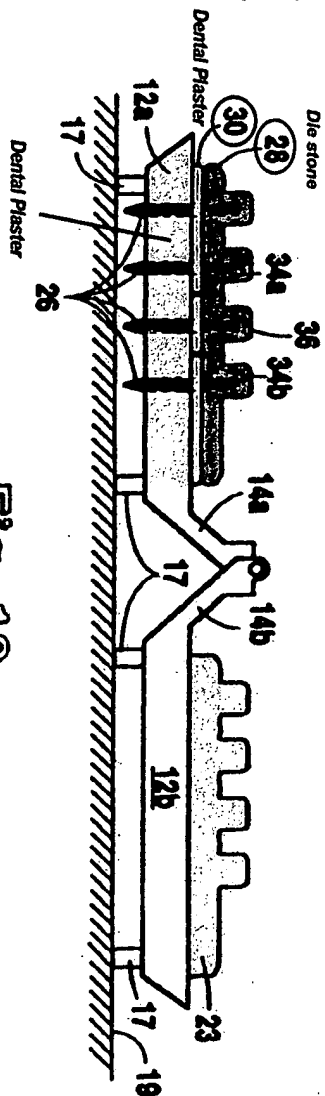


Fig. 12

(Col. 5, lines 8-16) After the dental plaster 30 has hardened, the dental model can be separated to remove the impression 22. The respective halves of the dental model will be contained in the trays 12a and 12b of the articulator as shown in FIG. 12. The working model of the tooth of interest 36 can be removed by cutting the die stone on either side of the tooth, as illustrated by cut lines 34a and 34b, and then pushing the appropriate pin to dislodge the tooth model from the overall model.

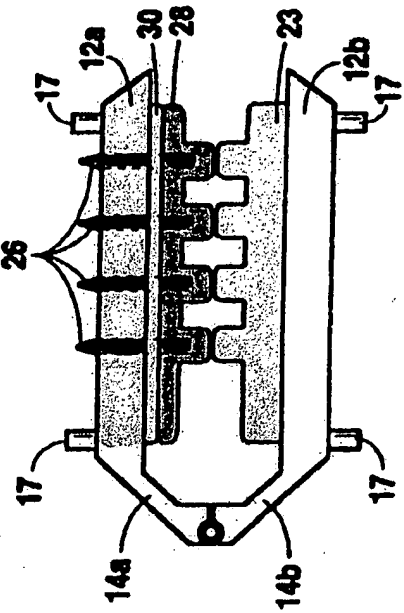


Fig. 13

The dental technician to proceed with fabrication of an artificial tooth or prosthetic in a conventional manner.

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